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# Paleolimnological studies of tundra lakes in the pechora delta (Nenets autonomous region, Russia)

*Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia*

## Abstract

© SGEM2018. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Polar region of the Russia not only play the leading role in world climatic system, but also quickly, with high sensitivity react to climatic changes. Investigation of lake from arctic region has an extreme importance for understanding of the modern environmental processes and their influence on northern ecosystems and biological diversity of these regions. Limnological characteristics and recent environmental history of twelve remote tundra lakes in the Pechora Delta (Nenets Autonomous Region, Russia) were investigated using both limnological and palaeolimnological methods with particular attention to subfossil Cladocera. All the lakes were sallow, alkaline or neutral, with an average pH of 8.2 and characterized by a low mineralization level. In total five cores were obtained in summer 2017, sliced into 1.0 cm-thin samples in the field and further investigated using palaeolimnological methods. Tree cores were freeze-dried and analysed for210Pb dating.210Pb results indicate a relatively stable, recent sedimentation rate of about 0.02-0.03 cm/a. The species distribution of Cladocera remains in recent sediment layers was similar to that observed in contemporary water samples. Subfossil Cladocera assemblages are characterized by the dominance of Chydorus sphaericus s.l., Bosmina (Eubosmina) longispina, Daphnia pulex agg. Paleolimnological investigation has shown that the major compositional changes in cladoceran and other paleoindicators are synchronous.

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## Keywords

Pechora delta, Subfossil Cladocera, Tundra lakes

## References

[1] Jeppesen E., Jensen J.P., Lauridsen T.L., Amsinck S.L., Christoffersen K., Søndergaard M., Michell S.F., Sub-fossils of cladocerans in the surface sediment of 135 lakes as proxies for community structure of zooplankton, fish abundance and lake temperature, Hydrobiologia, Netherlands, vol. 491, pp 321–330; 2003.

[2] Frolova L.A., Subfossil Cladocera (Branchiopoda, Crustacea) in climatic and palaeoenvironmental investigations in Eastern Siberia, International Multidisciplinary Scientific GeoConference, SGEM 2016, Russia, Book 4 Energy and Clean Technologies, Conference Proceedings vol. II, pp 601-607, 2016.

[3] New, M., Lister, D., Hulme, M., and Makin, I., A high-resolution data set of surface climate over global land areas, Clim. Res, 2002, vol. 21, pp. 1-25.

[4] Mukhin, N.M., Petrakova, V.M., and Shevchenko, E.Ya.,Climate conditions, in Geokriologicheskie usloviya Pechorskogo ugol'nogo basseina (Permafrost Conditions of the Pechora Coal Basin), Moscow: Nauka, 1964, pp. 20–29.

[5] Ulrich M., Wetterich S., Rudaya N., Frolova L., Schmidt J., Siegert C., Fedorov A.N., Zielhofer C., Rapid thermokarst evolution during the mid-Holocene in Central Yakutia, Russia, The Holocene, vol. 27/issue 12, pp. 1899-1913, 2017.

[6] Fefilova E.B., Fauna of the European North-East of Russia. Copepods, Russia, vol. 13, 319 p., 2015.

[7] Alekseev V.R., Tsalolikhin S.Y., Guide of freshwater zooplankton and zoobenthos of European Russia. Zooplankton, Russia, 496 p., vol 1., 2010.

[8] Borutsky E.V., Stepanova L.A., Kos M.S., Key to identification of Calanoida from fresh waters., Russia, 254 p., 1991.

[9] Manujlova E.F., Cladocera. Fauna of the USSR, USSR, 166 p., 1964.

[10] Kutikova L.A., Rotatoria. Fauna of the USSR, USSR, 747 p., 1970.

[11] Flossner D., Kiemen-und Blattfiifier, Branchiopoda Fischlause, Branchiura., Germany, 251 p., 1972.

[12] Szeroczynska K., Sarmaja-Korjonen K., Atlas of Subfossil Cladocera from Central and Northern Europe, 84 p., 2007.

[13] Sinev A.Yu., A key to identifying Cladocerans of the genus Alona (Anomopoda, Chydoridae) from the Russian European part and Siberia, Russia, vol. 81, №. 8, pp 926-939, 2002.